COSC 4368 (Spring 2024)

Review List Midterm Exam on Wednesday, March 6, 2:30-3:45p

The 2024 Midterm Exam is scheduled for Wednesday, March 6 at 2:30p in two class rooms: **CBB 124** (Students with last names starting A-G) and **103 SEC** (last names starting with H-Z). The exam will take 75 minutes and might be slightly too long. The exam is open-books and notes, but friends and other human beings are not permitted to help you and, more importantly, **the use of computers and cell phones is not permitted!**

Weight: The midterm exam counts 21% towards your overall grade.

Relevant slide shows, pasted from the COSC 4368 Website (the introduction to AI material will be covered in the final exam):

* 2024 Search Transparencies:
  + [Search1](http://www2.cs.uh.edu/~ceick/ai/search1.pptx) (Classification of Search Problems, Terminology, and Overview ), [Search2](http://www2.cs.uh.edu/~ceick/ai/search2.pptx) (Problem Solving Agents), [Search3](http://www2.cs.uh.edu/~ceick/ai/search3.pptx) (Heuristic Search, Exploration and Local Search), [Search4](http://www2.cs.uh.edu/~ceick/ai/search4.pptx) (Randomized Hill Climbing and Backtracking; not covered in textbook), [Search5: Games](http://www2.cs.uh.edu/~ceick/ai/Games2021.pptx) (credit for almost all slides goes to ai.berkely.edu, reduced coverage in 2022),  [Search6: Constraints Satisfaction Problems](http://www2.cs.uh.edu/~ceick/ai/CSP'.pptx) (credit for some slides goes to ai.berkeley.edu),  [Search7: More on Expansion Search](http://www2.cs.uh.edu/~ceick/ai/search7.pptx) (only material which centers on greedy search and A\* will be covered in 2024).

Midterm1 will only ask very basic question about games (Search5) and there will be nothing in the exam about card games. You should know the following approaches algorithms well: Best-first search, greedy best first search, A\*, randomized and classical hill climbing, simulated annealing, backtracking in general and using backtracking and local search for constraint satisfaction problems.

Evolutionary Computing

2023 Teaching Material on Evolutionary Computing (**EC**): EC1: [Introduction to Evolutionary Computing](http://www2.cs.uh.edu/~ceick/ai/EC1_2023.pptx) (by Eiben and Smith covering Chapter 3 of their book) and EC2:[Example: Using EC to Solve Travelling Salesman Problems](http://www2.cs.uh.edu/~ceick/ai/EC2.pptx), [Eiben-Smith Introduction to EA](http://www2.cs.uh.edu/~ceick/ai/Eiben-Smith-EC.pdf) (they call 'EC': 'EA'!),

Game Theory

[G1](http://www2.cs.uh.edu/~ceick/ai/G1.pptx): Introduction to Game Theory (USC Economics slide show by Shivendra Awasthi (???), will be used in the lecture)

Machine Learning

[A Gentle Introduction to Machine Learning](http://www2.cs.uh.edu/~ceick/ai/4368-ML-Intro.pptx)

Reinforcement Learning

Reinforcement Learning: [RL1](http://www2.cs.uh.edu/~ceick/ai/RL1.pptx) (Introduction to Reinforcement Learning)

Focusing on the role of exploration/exploitation, differences to other learning methods, know what policies are, Bellman Equations, Temporal difference learning, you should be able to provide the Bellman equations for an example and should be able to apply temporal difference learning for an example world. Q-Learning is not relevant for the midterm exam.

Tentative weights of topics in the midterm exam: Search 50-65%, Machine Learning 20-25%, Games (8%), EC(10%).

Relevant material from the Russel textbook (Fourth Edition):

Chapter 3: pages 63-106; Chapter 4: 110-115 Chapter 5: 146-158, Chapter 6: 180-200, Chapter 17: 562-569, 572-576 Chapter 22: 789-799.

Relevant pages from the Eiben-Smith Chapter: The whole article except sections 2.4.1, 2.5 and 2.7 are not relevant for the 2024 Midterm Exam.

Other relevant material:

[Backtracking - Wikipedia](https://en.wikipedia.org/wiki/Backtracking)

[Eiben-Smith-EC.pdf (uh.edu)](https://www2.cs.uh.edu/~ceick/ai/Eiben-Smith-EC.pdf)